

WHAT IS CLAIMED IS:

1 1. A thermoplastic injection molded one-piece
2 closure for dispensing dry particulate material, the
3 closure having an end wall bounded by a periphery and
4 having a relatively large opening and/or a plurality of
5 shaker openings, a flap or flaps adapted to
6 respectively close said opening or openings, the flap
7 or flaps each being integrally connected to the end
8 wall by a respective living hinge spaced inward from
9 the periphery of the end wall, each flap having a lower
10 side and a hollow plug on the lower side for each
11 opening in the end wall associated with the flap, the
12 hollow plug or plugs each being arranged to seal an
13 associated opening when the respective flap is in a
14 closed position adjacent the end wall and permit
15 dispensing through the associated opening when the
16 respective flap is in an open position where it is
17 rotated about the associated hinge from said closed
18 position, the plugs and apertures being precision
19 molded relative to one another by surfaces carried on
20 the same mold side.

1 2. A closure as set forth in claim 1, wherein
2 said plug or plugs are dimensioned to provide a touch
3 fit seal with their associated apertures.

1 3. A closure as set forth in claim 1, wherein
2 said aperture or apertures have tapered surface
3 boundaries such that the apertures are smaller in size
4 with distance from an upper side of the end wall
5 whereby the plugs are adapted to avoid frictional

6 resistance with said apertures until a respective flap
7 is near its closed position.

1 4. A closure as set forth in claim 3, wherein
2 said end wall has an inner surface and said aperture or
3 apertures have a minimum size adjacent said inner
4 surface of said end wall.

1 5. A closure as set forth in claim 1, wherein
2 said aperture or apertures are configured to seal
3 between inner and outer surfaces of said end wall and
4 such sealing is effected in an area with a height that
5 is substantially smaller than the thickness of said end
6 wall.

1 6. A closure as set forth in claim 1, including a
2 cylindrical skirt depending from said end wall, said
3 skirt being internally threaded for screwing onto a
4 complimentarily shaped neck finish of a container.

1 7. A closure as set forth in claim 1, wherein
2 said plug or plugs are hollow wall structures extending
3 from a respective flap in a substantially perpendicular
4 direction from said flap.

1 8. A closure as set forth in claim 1, wherein
2 said plug or plugs are hollow formations having
3 relatively thin walls, said walls having interior and
4 exterior tapers.

1 9. A closure as set forth in claim 8, wherein
2 said plug or plugs have a length that is several times
3 the thickness of their wall.

1 10. A closure as set forth in claim 1, wherein
2 the length of said plug or plugs is approximately equal
3 to or slightly greater than the wall thickness of the
4 end wall.

1 11. A package comprising a bottle having a neck
2 finish, a cap comprising a thermoplastic injection
3 molded one-piece closure for dispensing dry particulate
4 material, the closure having an end wall bounded by a
5 periphery and having a spoon opening and/or a plurality
6 of shaker openings, a flap or flaps adapted to
7 respectively close said opening or openings, the flap
8 or flaps each being integrally connected to the end
9 wall by a respective living hinge spaced inward from
10 the periphery of the end wall, each flap having a lower
11 side and a hollow plug on the lower side for each
12 opening in the end wall associated with the flap, the
13 hollow plug or plugs being arranged to seal an
14 associated opening when the respective flap is in a
15 closed position adjacent the end wall and permit
16 dispensing through the associated opening when the
17 respective flap is in an open position where it is
18 rotated about the associated hinge from said closed
19 position, the plug or plugs and aperture or apertures
20 being precision molded relative to one another by
21 surfaces carried on the same mold side, the cap having
22 a peripheral portion structured to couple with the
23 bottle neck finish, and a shrink wrap band applied to
24 the exterior of the cap and bottle and shrunk in
25 position to envelope at least portions of the flap or
26 flaps of the cap and maintain the same in a closed
27 position until broken.

1 12. A method of making one-piece dispensing
2 closures comprising providing tooling elements that,
3 when closed, collectively form a mold cavity defining
4 the shape of the closure, the tooling elements being
5 assembled on one or the other of a pair of platens, one
6 platen being movable relative to the other, the cavity
7 being arranged to form an end wall with at least one
8 dispensing aperture and at least one flap integrally
9 hinged to the end wall at a location inwardly from a
10 periphery of the end wall and having a plug
11 registerable with each aperture as a pair when the flap
12 is closed over the end wall, each aperture and plug
13 pair being formed by tooling elements on a common
14 platen whereby precise location of each plug with
15 respect to its paired aperture is achieved.

1 13. A method as set forth in claim 12, wherein
2 the mold cavity tooling elements are configured to
3 produce a touch seal between the plug and aperture.

1 14. A method as set forth in claim 12, wherein
2 the mold cavity tooling elements are configured to form
3 the plug or plugs as thin wall hollow structures open
4 at ends distal from the respective flap or flaps.